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Discussion

Dr Hillel Laks *(Los Angeles, Calif)*. Thank you, Dr Jonas, Dr Kron. I would like to thank the association for the invitation to discuss this article and Dr Padalino for sharing his manuscript and information with us.

I think this is an important article because it allows us to focus a little bit on the issue of the place of adult CHD in the training of surgeons, the qualification of centers and surgeons who do this kind of operation, and the importance of analyzing outcomes in multicenter studies, because for most centers, the available numbers are not enough to really analyze them. Dr Padalino and his group from Italy have shown that in 7 centers approximately 34 cases were done per year per center, but there are obviously some who had much larger volumes than others. I wanted to ask: what were the types of centers, how many were children's hospitals, how many were general hospitals operating on children and adults, and how many were pure adult hospitals? In the Euro Cardio Survey, they found that of 71 centers that participated, 48 were considered referral centers, and of those 48, according to the Euro Survey Committee, only one fifth were considered as qualified to do adult congenital heart surgery. I think that associations and the population of surgeons needs to consider what is required for the training of a surgeon to do adult CHD and what is required for a center.

It is not too dissimilar to the situation with transplantation, where it is now recognized that a center requires not just a surgeon who can do the operation but a full team of specialists, nurses, and anesthesiologists and infrastructure to take care of very complex patients.

The numbers of these patients is increasing as the survivals have increased, and in Italy the number is estimated to be about 80,000 patients. In the United Kingdom, with about the same population, it is estimated that there were about 145,000 patients in 2000, and it is estimated that by the year 2010 there will be 185,000 patients with adult CHD. In the United States the estimate is 800,000 patients, recognizing that of live births with CHD, about 1.5 per 1000 are simple and 4.5 per 1000 complex. And as our results improve for the complex patients, more of them are surviving into adulthood and presenting us with the kind of problems that you describe. At UCLA we have done approximately 55 on average over the last 5 years of adult CHDs per year, and virtually none of them nowadays, with catheter techniques, are ASDs. Most of them are more complex. About 5% of our 1500 transplantations are for patients with CHD. Although in a center that is doing 1000 or 900 cases a year this is not a very large percentage of the volume, similar to transplantation, it does require a concentration of resources.

My other question for you is in view of the prevalence of the arrhythmias, both as postoperative complications and late morbidity. Are the centers doing prophylactic maze procedures and inserting AICDs to affect this early and late morbidity and mortality?

My last question concerns the numbers of patients referred for heart transplantations, double-lung and heart-lung transplantations, and how many of these centers are also transplantation centers?

I would like to congratulate you for a very excellent presentation and give my thanks to the association for allowing me to discuss this.

Dr Padalino. Thanks, Dr Laks, for your nice statement. Well, first of all, I would like to underline that we decided to start this study to evaluate the situation of resources in our country and to face the growing entity of this type of population, which is a very difficult one. Despite most of our patients being in NYHA class I or II, we expect these patients' conditions to become more complicated in the future.

As far as the centers that were involved, there are actually 7 centers that joined the study, and 50% of them are pediatric centers. Therefore they just deal with patients in the pediatric age, whereas the remaining centers have also an adult service. The limitation in getting the data also depends on this difference among these centers.

The same is applicable to your other question regarding the transplantation service; a few centers have transplantation services and facilities or they have government assignments to do transplantation surgery. Therefore diagnoses and patients that we selected might not reflect the real situation in our country.

As far as onset of arrhythmias and arrhythmia procedures, the main trend is to treat these patients with an ablation procedure, cryoablation or radiofrequency ablation, when it is indicated. However, indication for surgery depends on the EP cardiology service characteristics of each center.

As far as the heart-lung programs, heart-lung programs are not common, and only a few of our referring centers are involved in a heart-lung program. Thus they differ in the attitude they have when they face this kind of problem. I believe that a minority of our centers are involved in heart-lung programs.

Dr Richard Jonas *(Washington, DC)*. Dr. Padalino, Dr Laks has pointed out the importance of having a team that is specialized and familiar with complex congenital heart problems, and many such teams are based in a children's hospital. What sort of problems do you foresee in having middle-aged and elderly patients with congenital heart problems managed in a children's hospital, and what is the best way to deal with those problems?

Dr Padalino. I believe that treating an adult patient in a pediatric service can provoke a sort of inadequate treatment of adult patients, who also present with a lot of other problems—not only cardiologic problems, but frequently also psychological problems, internal medicine problems, and other things. Therefore, what we believe is that pediatric cardiologists and adult cardiologists should work together in trying to finalize the diagnosis and that the pediatric cardiac surgeon has to be involved in the treatment of this kind of lesion because the pediatric cardiac surgeon is the one who is in charge of the congenital heart lesion and therefore the one who knows better the lesion and also the physiology.

We believe also that more adult specialists have to be involved in the care of these patients. We think that adult congenital cardiac patient services should be a multispecialist team, in which cardiologists, congenital cardiac surgeons, intensive care unit specialists, EP cardiologists, imaging specialists, and also internal medicine, gynecology, and psychiatrics divisions have to be included.